SEVERN TRENT STL

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Certificate of Analysis

December 9, 2003

CCI Analytical Laboratories, Inc.
8620 Holly Drive
Everett, WA 98208

Attention: Chuck Rancatti

Date Received in Lab	:	October 9, 2003
Sample Type	:	One (1) Water
SDG Number	:	24132

CASE NARRATIVE

I. Introduction

On October 9, 2003, one water sample was received at the STL Richland (STLR) laboratory for radiochemical analysis. Upon receipt, the sample was assigned the STLR identification number as described on the cover page of the Analytical Data Package report form. The sample was assigned to Lot Number J3J090311.

II. Sample Receipt

The sample was received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical uncertainties.

The analyses requested were:

Radium-226 by method RICH-RC-5005 (EPA 903.1)
Radium-228 by method RICH-RC-5005 (EPA 904.0)

IV. Quality Control

The analytical result for each analysis performed includes a minimum of one laboratory control sample (LCS), and one reagent blank sample analysis. Any exceptions have been noted in the "Comments" section.

V. Comments

Radium-226 Analysis:

The LCS, batch blank and sample results are within acceptance limits.

Radium-228 Analysis:

The batch blank result was above half the RDL, but still below the RDL. The sample results are below the RDL and the data is accepted. Except as noted, the LCS, batch blank and sample results are within acceptance limits.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Reviewed and approved:

Garrett E. Knutson
Project Manager Assistant

Drinking Water Method Cross References

	DRINKING WATER ASTM METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**STL Richland's SOP number**
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants * $f(x,y,z,...)$. The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value ($S/\sqrt{n}$), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) u_c *Combined Uncertainty.*	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, u_c *the combined uncertainty.* The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC/MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.
RER	The equation Replicate Error Ratio = (S-D)/[sqrt($TPUs^2$ + $TPUd^2$)] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Date: 09-Dec-03

Sample Results Summary

STL Richland STLR

Ordered by Method, Batch No., Client Sample ID.

Report No. : 24328

SDG No: 24132

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
3286598 RICHRC5005									
	310124-1								
	F17MM1AA	RA-226	5.75E-02 +- 7.05E-02	U	pCi/L	100%	1.14E-01	1.00E+00	
	310124-1 DUP								
	F17MM1AD	RA-226	-4.10E-02 +- 1.47E-01	U	pCi/L	100%	2.89E-01	1.00E+00	
3286599 RICHRC5005									
	310124-1								
	F17MM1AC	RA-228	8.80E-01 +- 5.24E-01	J	pCi/L	82%	8.44E-01	3.00E+00	
	310124-1 DUP								
	F17MM1AE	RA-228	1.17E+00 +- 5.97E-01	J	pCi/L	83%	9.01E-01	3.00E+00	

No. of Results: 4

RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

J Qual - No U/c qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

Date: 09-Dec-03

QC Results Summary
STL Richland STLR
Ordered by Method, Batch No, QC Type,.

Report No. : 24328

SDG No.: 24132

Batch / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC/MDA
RICHRC5005								
3286598 BLANK QC								
F2F271AA	RA-226	3.95E-02 +- 1.47E-01	U	pCi/L	100%			2.71E-01
3286588 LCS								
F2F271AC	RA-226	3.10E+00 +- 7.30E-01		pCi/L	100%	100%	0.0	2.03E-01
RICHRC5005								
3286599 BLANK QC								
F2F291AA	RA-228	2.10E+00 +- 7.71E-01	J	pCi/L	84%			9.57E-01
3286599 LCS								
F2F291AD	RA-228	1.34E+01 +- 2.88E+00		pCi/L	83%	118%	0.2	9.17E-01
F2F291AC	RA-228	1.28E+01 +- 2.77E+00		pCi/L	84%	114%	0.1	8.94E-01

No. of Results: 5

Bias - (Result/Expected)-1 as defined by ANSI N13.30.
J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda/Total Uncert or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 09-Dec-03

Lab Name:	STL Richland	**SDG:**	24132	**Collection Date:**	10/7/2003 9:30:00 AM
Lot-Sample No.:	J3J090311-1	**Report No. :**	24328	**Received Date:**	10/9/2003 11:50:00 AM
Client Sample ID:	310124-1	**COC No. :**		**Matrix:**	WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3286599	RICHRC5005			**Work Order:** F17MM1AA		**Report DB ID:** 9F17MM10						
RA-226	6.75E-02	U	6.97E-02	7.05E-02	1.14E-01	pCi/L	100%	*0.51*	12/3/03 05:29 p		0.5001	ASC1MB
						4.31E-02	1.00E+00	*(1.6)*			L	
Batch: 3286599	RICHRC5005			**Work Order:** F17MM1AC		**Report DB ID:** 9F17MM10						
RA-226	8.80E-01	J	4.97E-01	5.24E-01	8.44E-01	pCi/L	82%	*(1.)*	12/6/03 08:48 a		0.5001	GPC3C
						3.86E-01	3.00E+00	*(3.4)*			L	

No. of Results: 2 Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 09-Dec-03

DUPLICATE RESULTS

Lab Name: STL Richland | SDG: 24132 | Collection Date: 10/7/2003 9:30:00 AM

Lot-Sample No.: J3J090311-1 | Report No. : 24328 | Received Date: 10/9/2003 11:50:00 AM

Client Sample ID: 310124-1 DUP | COC No. : | Matrix: WATER

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUncert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3288598	RICHRC5005			Work Order: F17MM1AD		Report DB ID: F17MM1DR			Orig Sa DB ID: 9F17MM10			
RA-226	-4.10E-02	U	1.46E-01	1.47E-01	2.89E-01	pCi/L	100%	-0.14	12/3/03 05:27 p		0.5011	ASC2HA
	5.75E-02	U	RER2 1.2			1.00E+00		-0.56			L	
Batch: 3288599	RICHRC5005			Work Order: F17MM1AE		Report DB ID: F17MM1ER			Orig Sa DB ID: 9F17MM10			
RA-228	1.17E+00	J	5.53E-01	5.97E-01	9.01E-01	pCi/L	83%	(1.3)	12/6/03 08:46 a		0.5011	GPC3D
	8.80E-01	J	RER2 0.7			3.00E+00		(3.9)			L	

No. of Results: 2 Comments:

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RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 09-Dec-03

Lab Name: STL Richland SDG: 24132

Matrix: WATER Report No.: 24328

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 3286598	RICHRC5005			Work Order: F2F271AA		Report DB ID: F2F271AB						
RA-226	3.95E-02	U	1.47E-01	1.47E-01	2.71E-01	pCi/L	100%	0.15	12/3/03 05:31 p		0.5017	ASC3HB
					1.21E-01	1.00E+00		0.54			L	
Batch: 3286599	RICHRC5005			Work Order: F2F291AA		Report DB ID: F2F291AB						
RA-228	2.10E+00	J	6.58E-01	7.71E-01	9.57E-01	pCi/L	84%	(2.2)	12/6/03 08:46 a		0.5017	GPC4A
					4.41E-01	3.00E+00		(5.4)			L	

No. of Results: 2 Comments:

10

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 09-Dec-03

LCS RESULTS

Lab Name: STL Richland **SDG:** 24132

Matrix: WATER **Report No. :** 24328

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 3286598	RICHRC5005			Work Order: F2F271AC			Report DB ID: F2F271CS						
RA-226	3.10E+00		4.25E-01	7.30E-01	2.03E-01	pCi/L	100%	3.11E+00	1.72E-01	100%	12/3/03 05:30 p	0.5046	ASC5UC
							Rec Limits:	70	130	0.0		L	
Batch: 3286599	RICHRC5005			Work Order: F2F291AC			Report DB ID: F2F291CS						
RA-228	1.28E+01		1.30E+00	2.77E+00	8.94E-01	pCi/L	84%	1.12E+01	2.79E-01	114%	12/6/03 08:46 a	0.5046	GPC4B
							Rec Limits:	70	130	0.1		L	
Batch: 3286599	RICHRC5005			Work Order: F2F291AD			Report DB ID: F2F291DS						
RA-228	1.34E+01		1.35E+00	2.88E+00	9.17E-01	pCi/L	83%	1.13E+01	2.83E-01	118%	12/6/03 10:38 a	0.5085	GPC4C
							Rec Limits:	70	130	0.2		L	

No. of Results: 3 Comments:

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Certificate of Analysis

January 6, 2005

CCI Analytical Laboratories, Inc.
8620 Holly Drive
Everett, WA 98208

Attention: Chuck Rancatti

Date Received in Lab	:	October 29, 2004
Sample Type	:	One (1) Water
SDG Number	:	27309

CASE NARRATIVE

I. Introduction

On October 29, 2004, one water sample was received at the STL Richland (STLR) laboratory for radiochemical analysis. Upon receipt, the sample was assigned the STLR identification number as described on the cover page of the Analytical Data Package report form. This sample was assigned to Lot Number J4J290344.

II. Sample Receipt

The sample was received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical uncertainties.

The analyses requested were:

Radium-226 by method RICH-RC-5005 (EPA 903.1)
Radium-228 by method RICH-RC-5005 (EPA 904.0)

IV. Quality Control

The analytical result for each analysis performed includes a minimum of one laboratory control sample (LCS), and one reagent blank sample analysis. Any exceptions have been noted in the "Comments" section.

V. Comments

Radium-226 Analysis:

The LCS was spilled while processing. However, the data is accepted as spike recoveries as a whole show the procedure to be in control. Except as noted, the LCS, batch blank, sample and sample duplicate results are within acceptance limits.

Radium-228 Analysis:

Upon first analysis, the Ra228 analysis failed. The batch was re-analyzed with the remaining sample volume; the results are acceptable. Except as noted, the LCS, batch blank, sample and sample duplicate results are within acceptance limits.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Reviewed and approved:

Erika Jordan
Project Manager

Drinking Water Method Cross References

	DRINKING WATER ASTM METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**STL Richland's SOP number**
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants * f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/vn), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) *u_c - Combined Uncertainty.*	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, *u_c the combined uncertainty*. The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC|MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the Work Order Number.
RER	The equation Replicate Error Ratio = (S-D)/[sqrt($TPUs^2 + TPUd^2$)] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Sample Results Summary

Date: 06-Jan-05

STL Richland STLR

Ordered by Method, Batch No., Client Sample ID.

Report No. : 27620

SDG No: 27309

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
4303134	RICHRC5005								
	410110-26								
	GVVQJ1AA	RA-226	1.39E-01 +- 6.99E-02	J	pCi/L	100%	7.40E-02	1.00E+00	
	4J21009-01 DUP								
	GVMVF1AF	RA-226	1.72E+00 +- 4.27E-01		pCi/L	100%	1.24E-01	1.00E+00	
4352245	RICHRC5005								
	410110-26								
	GVVQJ3AC	RA-228	2.85E-01 +- 2.56E-01	U	pCi/L	90%	4.20E-01	3.00E+00	

No. of Results: 3

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RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

QC Results Summary
STL Richland STLR

Date: 06-Jan-05

Ordered by Method, Batch No, QC Type,.

Report No. : 27620

SDG No.: 27319

Batch Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC|MDA
RICHRC5005								
1303134 BLANK QC								
GVR1E1AA	RA-226	7.40E-02 +- 4.95E-02	J	pCi/L	100%			6.38E-02
RICHRC5005								
1352245 BLANK QC								
G1CHK1AA	RA-228	6.12E-01 +- 2.84E-01	J	pCi/L	90%			3.69E-01
1352245 LCS								
G1CHK1AD	RA-228	5.05E+00 +- 1.11E+00		pCi/L	90%	98%	0.0	4.19E-01
G1CHK1AC	RA-228	5.21E+00 +- 1.14E+00		pCi/L	90%	101%	0.0	4.23E-01

No. of Results: 4

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

FORM I

SAMPLE RESULTS

Date: 06-Jan-05

Lab Name: STL Richland | **SDG:** 27309 | **Collection Date:** 10/26/2004

Lot-Sample No.: J4J290344-1 | **Report No. :** 27620 | **Received Date:** 10/29/2004 11:00:00 AM

Client Sample ID: 410110-26 | **COC No. :** | **Matrix:** WATER

Project: 410110

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4303134	RICHRC5005			**Work Order:** GVVQJ1AA		**Report DB ID:** 9GVVQJ10						
RA-226	1.39E-01	J	6.45E-02	6.99E-02	7.40E-02	pCi/L	100%	*(1.9)*	12/10/04 11:25 a		0.8594	ASCHMA
						2.98E-02	1.00E+00	*(4.)*			L	
Batch: 4352245	RICHRC5005			**Work Order:** GVVQJ3AC		**Report DB ID:** 9GVVQJ30						
RA-228	2.85E-01	U	2.50E-01	2.56E-01	4.20E-01	pCi/L	90%	*0.68*	1/5/05 08:35 a		0.9795	GPC3D
						1.93E-01	3.00E+00	*(2.2)*			L	

No. of Results: 2 **Comments:**

∞

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 06-Jan-05

DUPLICATE RESULTS

Lab Name:	STL Richland	**SDG:**	27277	**Collection Date:**	10/21/2004 8:05:00 AM
Lot-Sample No.:	J4J270337-1	**Report No. :**	27620	**Received Date:**	10/27/2004 3:40:00 PM
Client Sample ID:	4J21009-01 DUP	**COC No. :**		**Matrix:**	WATER

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4303134	RICHRC5005			Work Order: GVMVF1AF		Report DB ID: GVMVF1FR			Orig Sa DB ID: 9GVMVF10			
RA-226	1.72E+00		2.37E-01	4.27E-01	1.24E-01	pCi/L	100%	(13.9)	12/10/04 10:58 a		0.9379	ASC3RA
	1.17E+00		RER2 2.2			1.00E+00		(8.1)			L	

No. of Results: 1 Comments:

6

STL Richland
rptSTLRchDupV4.1 0 A97

RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

FORM II

Date: 06-Jan-05

BLANK RESULTS

Lab Name: STL Richland

SDG: 27319

Matrix: WATER

Report No. : 27620

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Lc	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 4303134	RICHRC5005			Work Order: GVR1E1AA		Report DB ID: GVR1E1AB						
RA-226	7.40E-02	J	4.74E-02	4.95E-02	6.38E-02	pCi/L	100%	(1.2)	12/10/04 11:19 a		1.0031	ASCEHA
					2.57E-02	1.00E+00		(3.)			L	
Batch: 4352245	RICHRC5005			Work Order: G1CHK1AA		Report DB ID: G1CHK1AB						
RA-228	6.12E-01	J	2.59E-01	2.84E-01	3.69E-01	pCi/L	90%	(1.7)	1/5/05 08:35 a		1.0012	GPC4B
					1.68E-01	3.00E+00		(4.3)			L	

No. of Results: 2 Comments:

STL Richland
rptSTLRchBlank
V4.10 A97

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

FORM II

Date: 06-Jan-05

LCS RESULTS

Lab Name: STL Richland

Matrix: WATER

SDG: 27319

Report No. : 27620

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
Batch: 4352245	RICHRC5005			**Work Order:** G1CHK1AC			**Report DB ID:** G1CHK1CS						
RA-228	5.21E+00		5.53E-01	1.14E+00	4.23E-01	pCi/L	90%	5.14E+00	1.27E-01	101%	1/5/05 08:36 a	1.0027	GPC4C
							Rec Limits:	70	130	0.0		L	
Batch: 4352245	RICHRC5005			**Work Order:** G1CHK1AD			**Report DB ID:** G1CHK1DS						
RA-228	5.05E+00		5.51E-01	1.11E+00	4.19E-01	pCi/L	90%	5.13E+00	1.27E-01	98%	1/5/05 08:36 a	1.003	GPC4D
							Rec Limits:	70	130	0.0		L	

No. of Results: 2 **Comments:**

Analytical Data Package Prepared For

CCI Analytical Laboratories

Radiochemical Analysis By

STL Richland

2800 G.W. Way, Richland Wa, 99354, (509)-375-3131.

Assigned Laboratory Code: STLR

Data Package Contains 14 *Pages*

Report No.: 32311

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
31532		604142-1	J6E010221-1	H4GNV1AA	9H4GNV10	6129148
		604142-1	J6E010221-1	H4GNV1AC	9H4GNV10	6129149

SEVERN TRENT STL

STL Richland
2800 George Washington Way
Richland, WA 99354

Tel: 509 375 3131 Fax: 509 375 5590
www.stl-inc.com

Certificate of Analysis

June 9, 2006

CCI Analytical Laboratories, Inc.
8620 Holly Drive
Everett, WA 98208

Attention: Chuck Rancatti

Date Received in Lab	:	May 1, 2006
Sample Type	:	One (1) Water
SDG Number	:	31532

CASE NARRATIVE

I. Introduction

On May 1, 2006, one water sample was received at the STL Richland (STLR) laboratory for radiochemical analysis. Upon receipt, the sample was assigned the STLR identification number as described on the cover page of the Analytical Data Package report form. This sample was assigned to Lot Number J6E010221.

II. Sample Receipt

The sample was received in good condition and no anomalies were noted during check-in.

III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical uncertainties.

The analyses requested were:

Radium-226 by method RICH-RC-5005 (EPA 903.1)
Radium-228 by method RICH-RC-5005 (EPA 904.0)

IV. Quality Control

The analytical result for each analysis performed includes a minimum of one laboratory control sample (LCS), and one reagent blank sample analysis. Any exceptions have been noted in the "Comments" section.

V. Comments

Radium-226 Analysis:
The LCS, batch blank, sample and sample duplicate results are within acceptance limits.

Radium-228 Analysis:
The LCS, batch blank, sample and sample duplicate results are within acceptance limits.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Reviewed and approved:

Sherryl A. Adam
Project Manager

Drinking Water Method Cross References

	DRINKING WATER ASTM METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**STL Richland's SOP number**
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D5174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants * f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/vn), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) ***u_c - Combined Uncertainty.***	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, ***u_c the combined uncertainty.*** The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC|MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the **Work Order** Number.
RER	The equation Replicate Error Ratio = (S-D)/[sqrt($TPUs^2 + TPUd^2$)] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Date: 07-Jun-06

Sample Results Summary

STL Richland STLR

Ordered by Method, Batch No., Client Sample ID.

Report No. : 32311

SDG No: 31574

Batch	Client Id / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	MDC or MDA	CRDL	RER2
6129148	RICHRC5005								
	20060427-32 DUP								
	H4W7P1AF	RA-226	3.64E-02 +- 1.09E-01	U	pCi/L	90%	2.03E-01	1.00E+00	
	604142-1								
	H4GNV1AA	RA-226	2.88E-02 +- 9.30E-02	U	pCi/L	100%	1.78E-01	1.00E+00	
6129149	RICHRC5005								
	20060427-32 DUP								
	H4W7P1AG	RA-228	3.47E-01 +- 2.32E-01	U	pCi/L	79%	4.69E-01	1.00E+00	1.0
	604142-1								
	H4GNV1AC	RA-228	7.32E-01 +- 2.61E-01	J	pCi/L	87%	4.16E-01	3.00E+00	

No. of Results: 4

RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.

U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

Date: 07-Jun-06

QC Results Summary
STL Richland STLR
Ordered by Method, Batch No, QC Type,.

Report No. : 32311

SDG No.: 31532

Batch / Work Order	Parameter	Result +- Uncertainty (2s)	Qual	Units	Yield	Recovery	Bias	MDC|MDA
RICHRC5005								
6129148 BLANK QC								
H40QV1AA	RA-226	-1.09E-01 +- 1.41E-01	U	pCi/L	110%			2.89E-01
6129148 LCS								
H40QV1AC	RA-226	1.34E+00 +- 3.66E-01		pCi/L	100%	97%	0.0	1.85E-01
RICHRC5005								
6129149 BLANK QC								
H40QW1AA	RA-228	6.14E-02 +- 1.58E-01	U	pCi/L	99%			3.76E-01
6129149 LCS								
H40QW1AC	RA-228	4.76E+00 +- 7.31E-01		pCi/L	88%	94%	-0.1	3.91E-01

No. of Results: 4

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM I

Date: 07-Jun-06

SAMPLE RESULTS

Lab Name: STL Richland
SDG: 31532
Collection Date: 4/27/2006

Lot-Sample No.: J6E010221-1
Report No. : 32311
Received Date: 5/1/2006 10:30:00 AM

Client Sample ID: 604142-1
COC No. :
Matrix: WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6129148	RICHRC5005			Work Order: H4GNV1AA		Report DB ID: 9H4GNV10						
RA-226	***2.88E-02***	U	9.3E-02	9.3E-02	1.78E-01	pCi/L	100%	*0.16*	6/4/06 01:45 p		0.9797 L	ASCKME
						7.33E-02	1.00E+00	*0.62*				
Batch: 6129149	RICHRC5005			Work Order: H4GNV1AC		Report DB ID: 9H4GNV10						
RA-228	***7.32E-01***	J	2.4E-01	2.6E-01	4.16E-01	pCi/L	87%	*(1.8)*	6/6/06 06:26 a		0.9797 L	GPC4B
						1.81E-01	3.00E+00	*(5.6)*				

No. of Results: 2 Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM II

Date: 07-Jun-06

DUPLICATE RESULTS

Lab Name: STL Richland
SDG: 31574
Collection Date: 4/27/2006 12:42:00 PM

Lot-Sample No.: J6E080115-4
Report No. : 32311
Received Date: 5/5/2006 11:00:00 AM

Client Sample ID: 20060427-32 DUP
COC No. :
Matrix: WATER

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6129148	RICHRC5005			Work Order: H4W7P1AF		Report DB ID: H4W7P1FR			Orig Sa DB ID: 9H4W7P10			
RA-226	3.64E-02	U	1.1E-01	1.1E-01	2.03E-01	pCi/L	90%	0.18	6/4/06 04:41 p		1.0007	ASC4UA
	2.06E-02	U	RER2 0.2			1.00E+00		0.67			L	
Batch: 6129149	RICHRC5005			Work Order: H4W7P1AG		Report DB ID: H4W7P1GR			Orig Sa DB ID: 9H4W7P10			
RA-228	3.47E-01	U	2.2E-01	2.3E-01	4.69E-01	pCi/L	79%	0.74	6/6/06 07:24 a		1.0007	GPC4A
	5.22E-01	J	RER2 1.0			1.00E+00		(3.)			L	

6

No. of Results: 2 Comments:

RER2 - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U|< qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is Estimated.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM II

Date: 07-Jun-06

BLANK RESULTS

Lab Name: STL Richland

SDG: 31532

Matrix: WATER

Report No. : 32311

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA ,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
atch: 6129148	RICHRC5005			Work Order: H40QV1AA		Report DB ID: H40QV1AB						
RA-226	-1.09E-01	U	1.4E-01	1.4E-01	2.89E-01	pCi/L	110%	-0.38	6/4/06 04:40 p		1.0001 L	ASC7RH
					1.32E-01	1.00E+00		-(1.5)				
atch: 6129149	RICHRC5005			Work Order: H40QW1AA		Report DB ID: H40QW1AB						
RA-228	6.14E-02	U	1.5E-01	1.6E-01	3.76E-01	pCi/L	99%	0.16	6/6/06 07:24 a		1.0001 L	GPC4B
					1.63E-01	3.00E+00		0.78				

No. of Results: 2 Comments:

10

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for but not detected above limiting criteria. Limit criteria is less than the Mdc/Mda or Total Uncert or not identified by gamma scan software.

FORM II

Date: 07-Jun-06

LCS RESULTS

Lab Name: STL Richland

SDG: 31532

Matrix: WATER

Report No. : 32311

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Primary Detector
itch: 6129148	RICHRC5005			Work Order: H40QV1AC			Report DB ID: H40QV1CS						
RA-226	1.34E+00		2.4E-01	3.7E-01	1.85E-01	pCi/L	100%	1.38E+00	3.50E-01	97%	6/4/06 04:42 p	1.0003 L	ASCEHA
							Rec Limits:	70	130	0.0			
itch: 6129149	RICHRC5005			Work Order: H40QW1AC			Report DB ID: H40QW1CS						
RA-228	4.76E+00		4.9E-01	7.3E-01	3.91E-01	pCi/L	88%	5.05E+00	2.15E-02	94%	6/6/06 07:24 a	1.0003 L	GPC4C
							Rec Limits:	70	130	-0.1			

No. of Results: 2 Comments: